

VERSION WITH MARKINGS SHOWING CHANGES MADESPECIFICATION:

Specification at page 1, line 5:

CROSS-RELATED APPLICATIONS

THIS APPLICATION IS A U.S. NATIONAL PHASE APPLICATION OF
PCT INTERNATIONAL APPLICATION PCT/JP00/03003.

CLAIMS:

1 1. (As Amended) A pressure-sensitive sensor ~~(4)~~ disposed at at least one
2 of an opening ~~(200)~~ and an opening-closing unit ~~(3)~~ for opening and closing said
3 opening, used for detecting contact of an object and preventing seizure of the
4 object between said opening and said opening-closing unit, said pressure-sensitive
5 sensor comprising:

6 pressure-sensitive means ~~(12)~~ for generating an output signal depending
7 on deformation; and

8 support means ~~(13)~~ for supporting said pressure-sensitive means in at least
9 one of said opening and said opening-closing unit,

10 wherein said support means has a greater flexibility than said pressure-
11 sensitive means.

1 2. (As Amended) The pressure-sensitive sensor of claim 1,

2 wherein said support means includes:

3 a deformation amplifying portion ~~(15)~~ for amplifying the deformation of
4 said pressure-sensitive means.

1 3. (As Amended) The pressure-sensitive sensor of claim 2,

2 wherein said deformation amplifying portion includes:

3 a hollow portion ~~(16)~~.

1 4. (As Amended) The pressure-sensitive sensor of claim 1,
2 wherein said support means includes:

3 a vibration damping portion ~~(17)~~ for damping vibration.

1 5. (As Amended) The pressure-sensitive sensor of claim 4,
2 wherein said support means includes:

3 a deformation amplifying portion ~~(15)~~ for amplifying the deformation of
4 said pressure-sensitive means,

5 said vibration damping portion serves also as said deformation amplifying
6 portion.

1 6. (As Amended) The pressure-sensitive sensor of claim 1,

2 wherein said support means is formed of a part of a weather strip ~~(18)~~ of
3 an automobile.

1 8. (As Amended) The pressure-sensitive sensor of claim 1, further
2 comprising:

3 plural electrodes ~~(20, 21)~~ for leading out signals; and

4 a resistor for detecting breakage ~~(24)~~ disposed between said electrodes for
5 detecting breakage of said electrodes.

1 9. (As Amended) The pressure-sensitive sensor of claim 1,

2 wherein said pressure-sensitive means is composed of a flexible
3 piezoelectric sensor ~~(12)~~, and

4 said support means flexibly supports said piezoelectric sensor along a
5 shape of edge of said opening or said opening-closing unit.

1 11. (As Amended) An object detecting device for detecting the contact of

2 ~~an~~the object, and preventing ~~a~~the seizure of the object between ~~an~~said opening
3 ~~(200)~~and ~~an~~said opening-closing unit ~~(3)~~ for opening and closing said opening,
4 said object detecting device comprising:

5 ~~asaid~~ pressure-sensitive sensor ~~(4)~~ of claim 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10
6 disposed at at least one of said opening and said opening-closing unit, said
7 pressure-sensitive sensor comprising:

8 pressure-sensitive means for generating an output signal depending on
9 deformation; and

10 support means for supporting said pressure-sensitive means in at least one
11 of said opening and said opening-closing unit, said support means having a greater
12 flexibility than said pressure-sensitive means; and

13 judging means ~~(5)~~ for judging the contact of the object with said pressure-
14 sensitive sensor on the basis of an output signal of said pressure-sensitive sensor.

1 12. (As Amended) The object detecting device of claim 11, further
2 comprising:

3 notice means ~~(40)~~ for informing a third party of a judging result of said
4 judging means.

1 14. (As Amended) The object detecting device of claim 11,
2 wherein said judging means includes:

3 a filter ~~(30)~~ for extracting only a specified frequency component from the
4 output signal of said pressure-sensitive sensor.

1 17. (As Amended) The object detecting device of claim 11,
2 wherein said judging means includes:

3 a signal input unit ~~(33)~~ for feeding the output signal of said pressure-
4 sensitive means;

5 a signal output unit ~~(34)~~ for issuing a judging result of judging the contact

6 of the object to said pressure-sensitive sensor; and

7 a bypass unit ~~(35)~~ for passing high frequency signal through between said
8 signal input unit and said signal output unit.

1 19. (As Amended) An object detecting device for detecting ~~at the~~ contact of
2 ~~an the~~ object, and preventing ~~at the~~ seizure of the object between ~~an said~~ opening
3 ~~(200)~~ and ~~an said~~ opening-closing unit ~~(3)~~ for opening and closing said opening,
4 said object detecting device comprising:

5 ~~an said~~ pressure-sensitive sensor ~~(4) of claim 9, or 10~~ disposed at at least
6 one of said opening and said opening-closing unit, said pressure-sensitive sensor
7 comprising:

8 pressure-sensitive means for generating an output signal depending on
9 deformation, said pressure-sensitive means being composed of a flexible
10 piezoelectric sensor; and

11 support means for supporting said pressure-sensitive means along a shape
12 of an edge of said opening or said opening-closing unit, said support means having
13 a greater flexibility than said pressure-sensitive means;

14 judging means ~~(5)~~ for judging the contact of the object with said pressure-
15 sensitive sensor on the basis of an output signal of said pressure-sensitive sensor;
16 and

17 a discharge unit ~~(24)~~ for discharging an electric charge generated in said
18 piezoelectric sensor disposed in at least one of said piezoelectric sensor and said
19 judging means.

1 20. (As Amended) An opening-closing device having a function for
2 detecting ~~at the~~ contact of ~~an the~~ object, and preventing ~~at the~~ seizure of the object
3 between ~~an said~~ opening ~~(200)~~ and ~~an said~~ opening-closing unit ~~(3)~~ for opening and
4 closing said opening, said opening-closing device comprising:

5 ~~an said~~ object detecting device of claim 11, or 19 comprising:

6 a pressure-sensitive sensor disposed at at least one of said opening and

7 said opening-closing unit, said pressure-sensitive sensor comprising:

8 pressure-sensitive means for generating an output signal depending on
9 deformation; and

10 support means for supporting said pressure-sensitive means in at least one
11 of said opening and said opening-closing unit, said support means having a greater
12 flexibility than said pressure-sensitive means; and

13 judging means for judging the contact of the object with said pressure-
14 sensitive sensor on the basis of an output signal of said pressure-sensitive sensor;

15 drive means ~~(6)~~ for driving said opening-closing unit; and

16 control means ~~(7)~~ for controlling said drive means so as to stop closing
17 action of said opening-closing unit or open said opening-closing unit when said
18 judging means judges the contact of the object with said pressure-sensitive sensor
19 when said opening-closing unit is closing.

1 21. (As Amended) The opening-closing device of claim 20,

2 wherein said control means includes:

3 a contact judging unit ~~(38)~~ of said opening-closing unit for judging the
4 contact of the object with said opening-closing unit on the basis of a detected drive
5 state when said contact judging unit detects the drive state when said drive means
6 drives said opening-closing unit; and

7 a controller ~~(7)~~ for controlling said drive means on the basis of an output
8 signal from at least one of said object detecting device and said contact judging
9 unit.

Claims 24-27 are newly added.